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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,121	05/31/2006	Xiang-Ning Li	US030493US	8123

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EXAMINER

NGUYEN, HIEN NGOC

ART UNIT	PAPER NUMBER
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3768

MAIL DATE	DELIVERY MODE
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01/22/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/596,121	Applicant(s) LI, XIANG-NING	
	Examiner HIEN NGUYEN	Art Unit 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05/31/2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/31/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Entrekin et al. (US 5,305,756), in view of Angelsen et al. (US 2005/0119572 A1) and further in view of Angelsen et al. (US 6,622,562).

Regarding claims 1, 3-5, 7-9 and 11, Entrekin discloses:

- a method of real-time volumetric ultrasonic imaging; see Entrekin col. 2, lines 23-27.
- using a two-dimensional array transducer to scan a region of interest in an azimuthal direction using a plurality of beams that have a common center axis; see Entrekin col. 6, lines 9-29; col. 3, line 56-col. 4, line 17; Fig. 7.
- projecting ultrasound reflections in each beam onto a common plane of projection, the reflections obtained for each beam being in the respective range of scanning depth; see Entrekin col. 3, line 63-col. 4, line 17.
- creating the volumetric ultrasound image from the ultrasound reflections projected onto the common plane of projection for all of the beams; see Entrekin col. 4, lines 14-17.

However, Entrekin does not disclose each of the beams scanning a plurality of ranges of scanning depths inversely related to the divergence angles of the beams. In the same field of endeavor Angelson disclose:

- the method of beams scanning a plurality of ranges of scanning depths inversely related to the divergence angles of the beams; see Angelson [0026] and Fig. 3.

It would have been obvious to one skill in the art at the time of the invention to modify Entrekin's method to include the beam scanning with an inverted relation with divergence angles in order to enable maintenance of the diameter below limits with a low total number of elements and avoid impractically small width of elements (for motivation see Angelsen US 6,622,562 abstract, last sentence; also see Entrekin et al., Fig. 6).

Regarding claims 2, 6, and 10 if the beams are scanned at a plurality of ranges then in order to create a useful volume (3D shape), the elevational dimension at the maximum depth must be substantially the same (see Angelsen et al. US 2005/0119572 A1, Fig. 1, item 110; also see Entrekin et al., Fig. 6, item 70). The controller would be set to perform this method step.

Conclusion

These are prior arts use in rejection: US 5,305,756; US 2005/0119572 A1 and (US 6,622,562).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HIEN NGUYEN whose telephone number is (571)270-7031. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571)272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. N./
Examiner, Art Unit 3768
12/29/08

/Long V Le/
Supervisory Patent Examiner, Art Unit 3768